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Le fer, la houille et la métallurgie à la fin du XIX^e siècle. By GEORGES VILLAIN. Paris: Armand Colin, 1901. 8vo, pp. xvi + 342.

THIS is a book of 336 pages devoted to the discussion of the coal, iron, steel, and metallurgical industries of France and Germany, with incidental references to other countries. Mr. Villain has traveled through the regions prominent in these trades, and has interviewed a considerable number of persons. The result of his investigations is conveyed in a number of chapters which give the impression of a series of sketchy essays. There is comparatively little technical discussion in the work, and the political economy of it is of the simplest possible description. The author's attention is devoted mainly to the commercial aspects of the above-mentioned industries, with some chapters on industrial betterment as practiced at Creusot.

The volume opens in the midst of the subject with an account of the orders for locomotives and rails placed by the French railways in 1899 on account of the Paris Exposition. These orders overtaxed the French locomotive works, showing them to be small and old-fashioned in equipment. The arrangements subsisting between the French government and the railways are of such a character that it is to the advantage of the latter to acquire as little new rolling stock as possible. Consequently locomotives are repaired indefinitely, and there are on French railways a great number of different models in use, some having seen as much as forty years of service. Orders for machines in such a country are necessarily small, and the practice is to split up these orders between different establishments. The result is that many of the costs of production such, for example, as designing, draughting, and estimating, and the cost of raw materials, are made exceptionally high. In 1900 there were 484 locomotives constructed in France; in the United States 3158.

In the production of steel the introduction of the basic process, by means of which ores high in phosphorus can be used, has built up the great steel region of France in the department of Meurthe-et-Moselle. In contrast with American methods this region seems but modestly equipped. The furnaces of France have an average output of 150 to 170 tons per day, while those of the United States produce 500 tons, and many of them much more. The "American Danger" is referred to when mention is made that the United States produces nearly one-

third of the iron of the world, and of steel rails alone exports 300,000 tons, or twice the entire French production.

The chief obstacle to a high development of the iron and steel trades in France lies in the fact that she lacks a sufficient supply of coke to satisfy the needs of her industries. There is, however, much dissatisfaction with the way in which fuel supplies are handled. The chief matters complained of are that French coals are many of them unfit for use in the furnace; that coal miners are hard to obtain in sufficient numbers; that the cost of transporting coke over French railways is too high; that therefore France has to depend upon what German and Belgian syndicates wish to sell after supplying themselves; and, finally, that the French syndicate of coal miners restricts production and dictates hard conditions for the consumer.

The history of French and German selling associations in the coal, iron, and steel trades is given, in detail, in several chapters, and this may be considered the most valuable original matter in the book to the American reader. It shows that these associations began as penalty agreements to restrict production and that as they broke down in the various trades they gave place to more highly organized, incorporated, combined, selling agencies capable of holding the individual producing concerns in line with an agreement, because standing between producers and consumers, conducting all business between the two. The author asserts that the policy of selling associations is to restrict the quantity of goods placed upon the home market, and by that means raise prices to a profitable figure. All excess of production above the determined amount is to be marketed outside the country for what it will bring; the home protected market, in other words, is looked to for profits. The result is that France, Germany, and Belgium are taxed to supply other countries with iron and steel at low prices. This result he holds is to achieve the same sort of folly that government bounties have achieved in the European beet-sugar industry, to the advantage of England.

A very reasonable conclusion of the author is that France is not in a position to compete in the world's markets with such a country as the United States, in those branches of the steel trade where the economies of production on a large scale are the controlling factor. The function of France is rather to supply specialties—articles “made to order”—involving peculiar skill and much hand labor, requiring art in graceful designing and great care and experience in finishing.

EDWARD D. JONES.